Data Analysis Expressions (DAX)

Purpose

This document serves to summarize proof of concept findings explaining the benefits and liabilities of implementing DAX in VAConnects reporting.

Glossary and Terms

**Data Analysis Expressions (DAX)** is a formula expression language used in Analysis Services, Power BI, and Power Pivot in Excel. DAX formulas include functions, operators, and values to perform advanced calculations and queries on data in related tables and columns in tabular data models.

**Power Pivot** is an Excel add-in you can use to perform powerful data analysis and create sophisticated data models (a collection of tables with relationships). With Power Pivot, you can mash up large volumes of data from various sources and rapidly perform information analysis. DAX is used as the base for Excel column level calculations, measures, and formula definitions.

Data Mart, introduced by Power BI in 2022, is a subject-specific database aligned to the needs of a specific user group. In other words, a data mart is a curated subset of data pertinent to a specific subgroup within an organization and is generally reserved for analytics.

<https://www.phdata.io/blog/what-are-microsoft-datamarts/>

<https://www.reddit.com/r/PowerBI/comments/12xh1fu/what_are_your_experiences_with_power_bi_datamarts/>

**Data sets** are a collection of data that corresponds to one or more database tables, where every column of a table represents a particular variable, and each row corresponds to a given record of the data set in question. DAX scripts are created and archived in Power BI as data sets.

Process Workflow

VLP pilot use of DAX (Dec 2023)

The VLP team discovered after initial consultation with Mike Gladden of Tech Dynamism that DAX data set performance once pushed from local to Staging/Production was dependent on the Data Mart refresh state. This means that the output of reports that use DAX for dynamic calculations excluded contemporaneous data, such as “scores”, if run prior to a Data Mart refresh. The VLP developers found that SQL calculations that queried the database directly (i.e., not stored in a separate Power BI Report Builder DAX “calculation” data set) returned dynamic data accurately. Therefore, the VLP developer team did not find use of DAX as a reliable option for VLP paginated reporting needs.

Follow up consult April 2024

Consult with Michael Gladden 4/12/2024 finds his guidance that DAX works best on data sources that contain data that is largely static (for example, demographic data) or where changes to data have minimal impact (aggregated data in visualizations). DAX is not recommended with current functionality for paginated reports that contain data points that return dynamic “score” data “on demand”. In short, currently, DAX data sets are not performant enough to process real time dynamic data using Power BI Report Builder. However, DAX may be performant enough applied to aggregated data for use to create visualizations in Power BI Desktop.

Process History

<document all final versions, revisions and reason for version and date>

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| Name/  Title | <signature of author, reviewers, PI approver(s)> | Initial version <create date> |
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